élantec
HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

EL7154C

High Speed, Monolithic Pin Driver

Features

- Comparatively low cost
- 3-State output
- 3V and 5V Input compatible
- Clocking speeds up to 10MHz
- 20ns Switching/delay time
- 4A Peak drive
- Isolated drains
- Low output impedance—2.5Ω
- Low quiescent current—5mA
- Wide operating voltage—4.5V–16V
- Isolated P-channel device
- Separate ground and V_L pins

Applications

- Loaded circuit board testers
- Digital testers
- Level shifting below GND
- IGBT drivers
- CCD drivers

Ordering Information

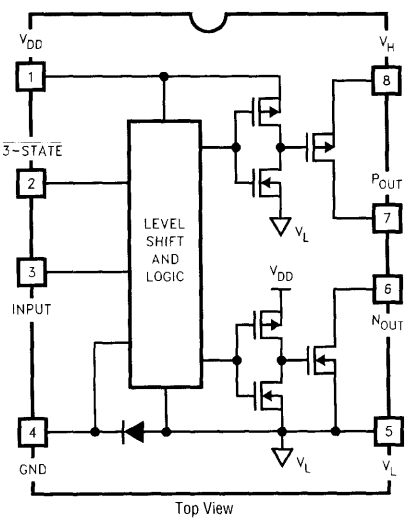
Part No.	Package	Tape & Reel	Outline #
EL7154CN	PDIP-8	-	MDP0031
EL7154CS	SO-8	-	MDP0027
EL7154CS-T7	SO-8	7 in	MDP0027
EL7154CS-T13	SO-8	13 in	MDP0027

General Description

The EL7154C 3-state pin driver is particularly well suited for ATE and level shifting applications. The 4A peak drive capability, makes the EL7154C an excellent choice when driving high speed capacitive lines.

The p-channel MOSFET is completely isolated from the power supply, providing a high degree of flexibility. Pin (7) can be grounded, and the output can be taken from pin (8) when a "source follower" output is desired. Then n-channel MOSFET has an isolated drain, but shares a common bus with pre-drivers and level shifter circuits. This is necessary to ensure that the nchannel device can turn off effectively when V_L goes below GND. In some power-FET and IGBT applications, negative drive is desirable to insure effective turn-off. The EL7154C can be used in these applications by returning V_L to a moderate negative potential.

Connection Diagrams



Top View

Manufactured under U.S. Patent Nos. 5,334,883, #5,341,047, #5,352,578, #5,352,389, #5,351,012, #5,374,898

Absolute Maximum Ratings (T_A = 25 °C)

Supply (V_{DD} to V_L; V_H–V_L, V_H to GND),		Storage Temperature Range	-65°C to +150°C
V+ to V_H	16.5V	Ambient Operating Temperature	-40° C to +85°C
V_L to GND	-5V	Operating Junction Temperature	125°C
Input Pins	-0.3V below V_L to +0.3V above V_{DD}	Power Dissipation	
		SO	570 mW
Peak Output Current	4A	PDIP 1050 mW	

Important Note:

All parameters having Min/Max specifications are guaranteed. Typ values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: $T_J = T_C = T_A$

DC Electrical Characteristics

T_A = 25°C, V_{DD} = +12V, V_H = +12V, V_L = -3V, unless otherwise specified

Parameter	Description	Test Conditions	Min	Typ	Max	Units
Input						
V_{IH}	Logic "1" Input Voltage		2.4			V
I_{IH}	Logic "1" Input Current	$V_{IH} = V_{DD}$		0.1	10	µA
V_{IL}	Logic "0" Input Voltage				0.6	V
I_{IL}	Logic "0" Input Current	V_{IL} = 0V		0.1	10	µA
V_{HYS}	Input Hysteresis			0.3		V
Output						
R_{OH}	Pull-Up Resistance	I_{OUT} = -100mA		1.5	4	Ω
R_{OL}	Pull-Down Resistance	I_{OUT} = +100mA		2	4	Ω
I_{OUT}	Output Leakage Current	V_{DD}/GND		0.2	10	µA
I_{PK}	Peak Output Current	Source Sink		4.0 4.0		A
I_{DC}	Continuous Output Current	Source/Sink	200			mA
Power Supply						
I_S	Power Supply Current	Inputs = V_{DD}		1	2.5	mA
V_S	Operating Voltage		4.5		16	V
I_G	Current to GND (Pin 4)			1	10	µA
I_H	Off Leakage at V_H	Pin 8 = 0V		1	10	µA

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AC Electrical Characteristics

T_A = 25°C unless otherwise specified

Parameter	Description	Test Conditions	Min	Typ	Max	Units
Switching Characteristics (V_{DD} = V_H = 12V; V_L = -3V)						
t_R	Rise Time	C_L = 100pF		4	25	ns
		C_L = 2000pF		20		
t_F	Fall Time	C_L = 100pF		4	25	ns
		C_L = 2000pF		20		
t_{D-1}	Turn-Off Delay Time	C_L = 2000pF		20	25	ns
t_{D-2}	Turn-On Delay Time	C_L = 2000pF		10	25	ns
t_{D-1}	3-State Delay				25	ns
t_{D-2}	3-State Delay				25	ns

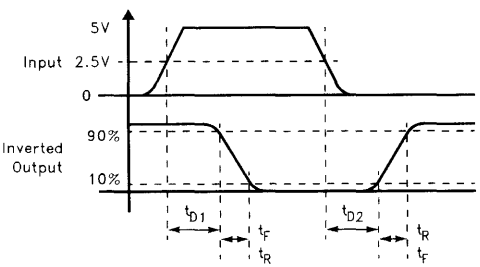
Truth Table

3-State	Input	P_{OUT}	N_{OUT}
0	0	Open	Open
0	1	Open	Open
1	0	HIGH	Open
1	1	Open	LOW

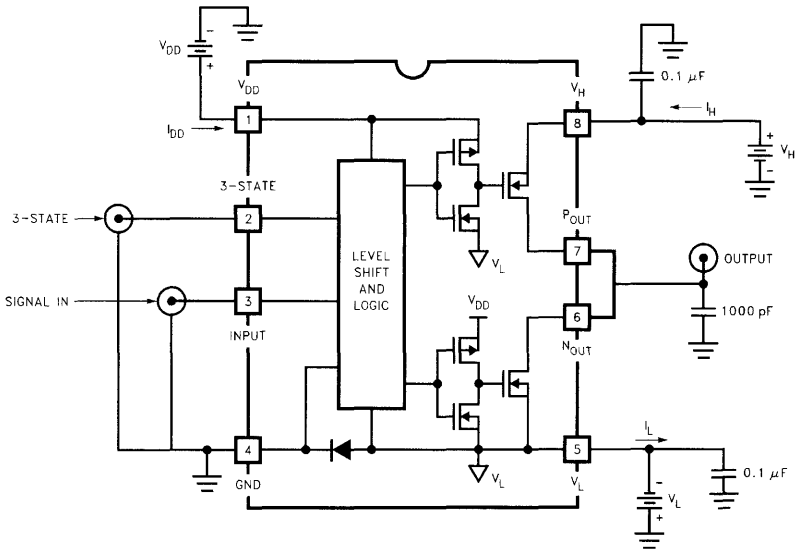
Nominal Operating Voltage Range

Pin	Min	Max
V_L	-3	0
V_{DD}-V_L	5	15
V_H-V_L	2	15
V_{DD}-V_H	-0.5	15
V_{DD}	5	15

Timing Table



Standard Test Configuration



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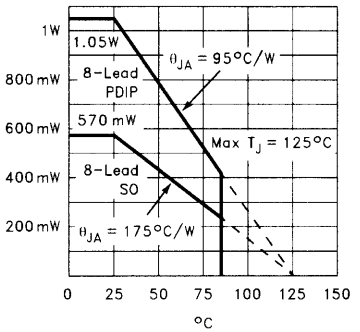
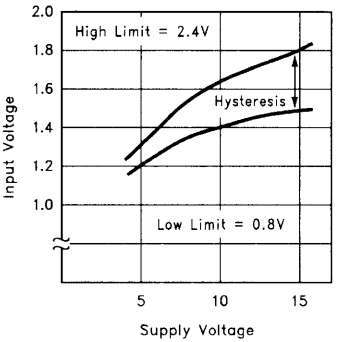
Typical Performance Curves

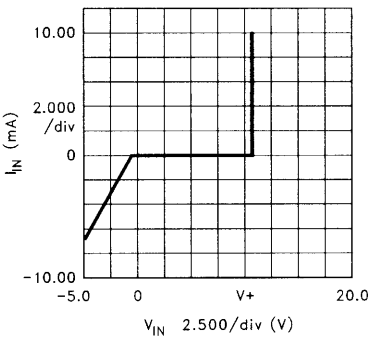
Max Power/Derating Curves



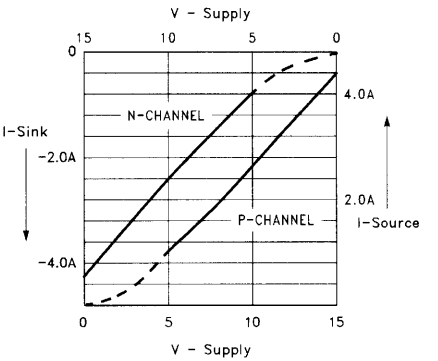
Switch Threshold vs Supply Voltage



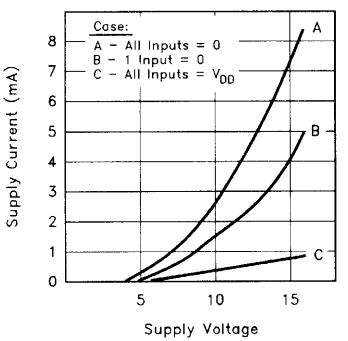
Input Current vs Voltage



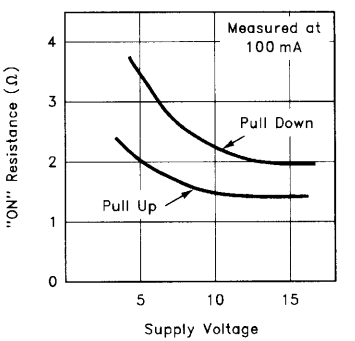
Peak Drive vs Supply Voltage



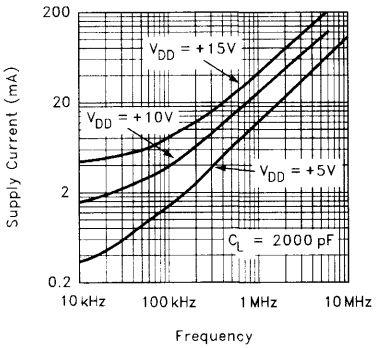
Quiescent Supply Current



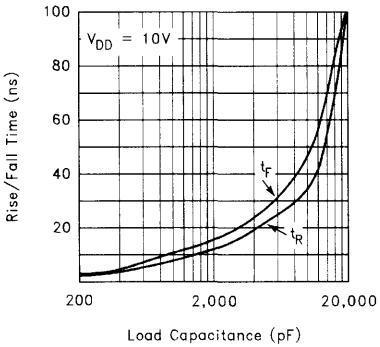
"ON" Resistance vs Supply Voltage



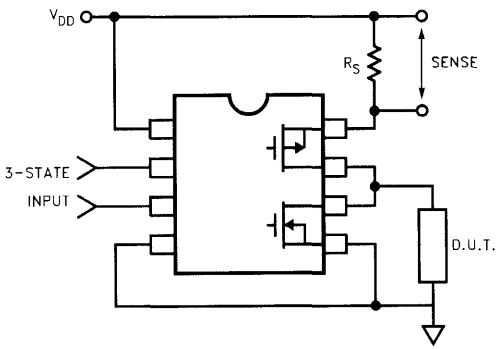
Average Supply Current vs Voltage and Frequency



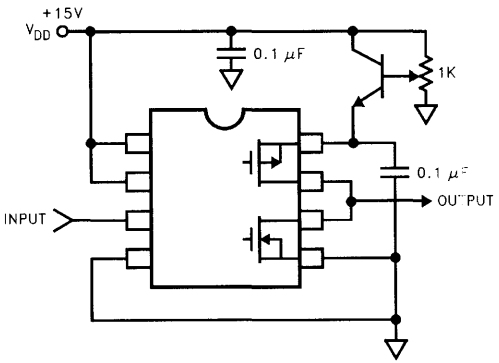
Rise/Fall Time vs Load



Pin Driver



Adjustable Amplitude Pulse Generator



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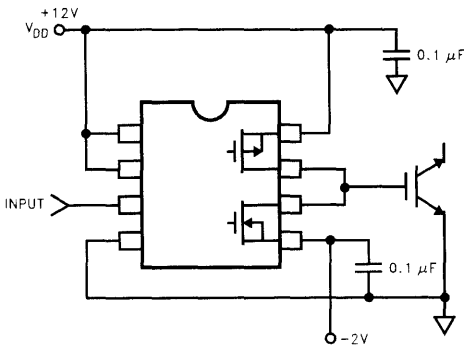
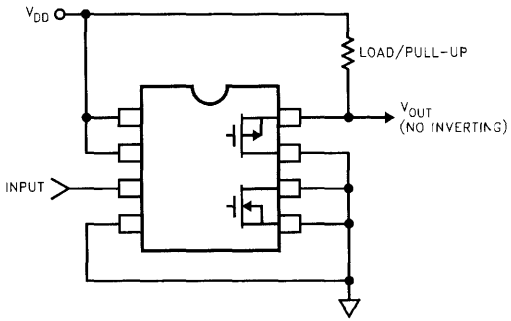
IGBT Driver (with Negative Swing)



PMOS Follower



Resonant Gate Driver